UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION I
ONE CONGRESS STREET- SUITE 1100 (CIP)
BOSTON, MASSACHUSETTS 02114 - 2023

FACT SHEET

DRAFT NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)
PERMIT TO DISCHARGE TO WATERS OF THE UNITED STATES.

NPDES PERMIT # MA0000531

NAME AND ADDRESS OF APPLICANT:

Boston Sand and Gravel Company
169 Portland Street
Boston, MA 02114

NAME AND ADDRESS OF FACILITY WHERE DISCHARGE OCCURS:

Boston Sand and Gravel Company
500 Front Street
Charlestown, MA 02129

RECEIVING WATER: Millers River to Charles River to Boston Inner Harbor

CLASSIFICATION: B

TABLE OF CONTENTS

I. PROPOSED ACTION

The above named applicant has applied to the U.S. Environmental Protection Agency (EPA) and the Massachusetts Department of Environmental Protection (MassDEP) for the re-issuance of a National Pollutant Discharge Elimination System (NPDES) permit to discharge treated process and storm water into the designated receiving water. The permit was issued and became effective to Boston Sand & Gravel Company (BS&G) on December 14, 2001 (the Current Permit) and expired on December 14, 2006. EPA received and approved a request for a 60 day extension for submittal of the permit renewal application on May 15, 2006. Subsequently, BS&G submitted a permit renewal application dated August 14, 2006. Since the permit renewal application was deemed complete by EPA, the permit has been administratively continued.

II. TYPE OF FACILITY

Boston Sand and Gravel Company (BS&G) operates two facilities in Charlestown, Massachusetts: a ready-mix concrete batching plant (Plant) located at 500 Front Street and a vehicle maintenance facility (Garage) located at 40 Bunker Hill Industrial Park Drive (See Attachments A and B - Site Map and Site Locus). Process water commingled with storm water is treated by settling, chemical treatment and clarification at the Plant at the wastewater treatment facility (WWTF), prior to final discharge to the Millers River. Activities at the Garage are conducted within an enclosed facility. There is no exposure of industrial activities and related pollution to storm water at the Garage. Inside the Garage, snow melt and rainwater from the vehicles flow to internal floor drains which connect to an oil/water separator. The separator then discharges to the MWRA wastewater system. The separator is inspected by BS&G employees on a monthly basis and is on the MWRA oil/water separator database.

Both the Plant and the Garage are also currently covered under the Multi-Sector General Permit (MSGP-2000) for storm water. BS&G intends to discontinue general permit coverage for the Garage and Plant by submitting a Notice of Termination (NOT) to terminate coverage under the MSGP-2000 for the Plant and Garage once the new MSGP is issued, or when the individual NPDES permit is issued, whichever is sooner. Since the Garage is a separate, non-contiguous facility with no outdoor activities that could result in exposure of storm water to industrial activities, BS&G intends to submit a no exposure certification for the Garage. Storm water permitting requirements at the Plant will be addressed under an individual NPDES permit.

III. SUMMARY OF MONITORING DATA

A quantitative description of the discharges in terms of significant effluent parameters based on discharge monitoring reports (DMRs) submitted for Boston Sand and Gravel during the time period from January 2002 to March 2006 was reviewed and used in the development of the draft National Pollutant Discharge Elimination System (NPDES) permit (Draft Permit). A summary of this data is provided in Attachment C to this Fact Sheet.

IV. PERMIT BASIS AND EXPLANATION OF EFFLUENT LIMIT DERIVATIONS

The effluent limitations, monitoring requirements, and any implementation schedule, if required, may be found in Part 1 (Effluent Limitations and Monitoring Requirements) of the Draft Permit. The permit re-application is part of the administrative file (Permit No. MA0000531).

A. General Requirements

The Clean Water Act (CWA) prohibits the discharge of pollutants to waters of the United States without a NPDES permit unless such a discharge is otherwise authorized by the CWA. The NPDES permit is the mechanism used to implement technology and water quality-based effluent limitations and other requirements including monitoring and reporting. The draft permit was developed in accordance with various statutory and regulatory requirements established pursuant to the CWA and applicable State regulations. During development, EPA considered the most recent technology-based treatment requirements, water quality-based requirements, and all limitations and requirements in the current/existing permit. The regulations governing the EPA NPDES permit program are generally found at 40 CFR Parts 122, 124, 125, and 136. The general conditions of the draft permit are based on 40 CFR §122.41 and consist primarily of management requirements common to all permits. The effluent monitoring requirements have been established to yield data representative of the discharge under authority of Section 308(a) of the CWA in accordance with 40 CFR §122.41(j), §122.44(i), and §122.48.

1. Technology-Based Requirements

Subpart A of 40 CFR §125 establishes criteria and standards for the imposition of technology-based treatment requirements in permits under Section 301(b) of the CWA, including the application of EPA promulgated effluent limitations and case-by-case determinations of effluent limitations under Section 402(a)(1) of the CWA.

Technology-based treatment requirements represent the minimum level of control that must be imposed under Sections 301(b) and 402 of the CWA (see 40 CFR §125 Subpart A) to meet best practicable control technology currently available (BPT) for conventional pollutants and some metals, best conventional control technology (BCT) for conventional pollutants, and best available technology economically achievable (BAT) for toxic and non-conventional pollutants. In general, technology-based effluent guidelines for non-POTW facilities must be complied with as expeditiously as practicable but in no case later than three years after the date such limitations are established and in no case later than March 31, 1989 [See 40 CFR §125.3(a)(2)]. Compliance schedules and deadlines not in accordance with the statutory provisions of the CWA cannot be authorized by a NPDES permit.

EPA has not promulgated technology-based National Effluent Guidelines for Concrete Products (SIC 3272). In the absence of technology-based effluent guidelines, the permit writer is authorized under Section 402(a)(1)(B) of the CWA to establish effluent limitations on a case-by-case basis using Best Professional Judgement (BPJ). In regards to the discharge from boiler

blowdown, EPA has used BPJ to apply the Steam Electric Power Generating Point Source Category ELGs at 40 CFR §423. These ELGs are comparable, since Steam Electric Power Generating Facilities also discharge boiler blowdown water. According to these ELGs, the discharge of pollutants from low volume waste sources [such as boiler blowdown] shall not exceed the quantity determined by multiplying the flow of low volume waste sources times the following concentrations: 100.0 mg/L daily maximum and 30.0 average monthly for TSS, and 20.0 mg/L maximum daily and 15.0 mg/L average monthly for oil and grease.

The 2000 Multi-Sector General Permit for storm water discharges from industrial sources was reviewed to determine technology-based limitations for this facility. Sector E of the MSGP (Glass Clay, Cement, Concrete, and Gypsum Products) for SIC Code 3272 contains benchmark monitoring cutoff concentrations of 100 mg/L for TSS and 1.0 mg/L for Total Recoverable Iron. Additionally, Sector E of the MSGP contains benchmark monitoring cutoff concentrations for Cement Manufacturing Facilities Material Storage Runoff of 50 mg/L daily maximum for TSS and an effluent limitation of 6.0-9.0 SU for pH.

2. Water Quality-Based Requirements

Water quality-based criteria are required in NPDES permits when EPA and the State determine that effluent limits more stringent than technology-based limits are necessary to maintain or achieve state or federal water-quality standards (See Section 301(b) (1)(C) of the CWA). Water quality-based criteria consist of three (3) parts: 1) beneficial designated uses for a water body or a segment of a water body; 2) numeric and/or narrative water quality criteria sufficient to protect the assigned designated use(s) of the water body; and 3) anti-degradation requirements to ensure that once a use is attained it will not be degraded. The Massachusetts State Water Quality Standards, found at 314 CMR 4.00, include these elements. The State Water Quality Regulations limit or prohibit discharges of pollutants to surface waters and thereby assure that the surface water quality standards of the receiving water are protected, maintained, and/or attained. These standards also include requirements for the regulation and control of toxic constituents and require that EPA criteria, established pursuant to Section 304(a) of the CWA, be used unless site-specific criteria is established. EPA regulations pertaining to permit limits based upon water quality standards and state requirements are contained in 40 CFR §122.44(d).

Section 101(a)(3) of the CWA specifically prohibits the discharge of toxic pollutants in toxic amounts. The Commonwealth of Massachusetts (State) has a similar narrative criterion in their water quality regulations that prohibits such discharges [See Massachusetts Title 314 CMR 4.05(5)(e)]. The effluent limits established in the Draft Permit assure that the surface water quality standards of the receiving water are protected, maintained, and/or attained.

3. Anti-Backsliding

EPA's anti-backsliding provision as identified in Section 402(o) of the Clean Water Act and at 40 CFR §122.44(l) prohibits the relaxation of permit limits, standards, and conditions unless the circumstances on which the previous permit was based have materially and substantially changed

since the time the permit was issued. Anti-backsliding provisions apply to effluent limits based on technology, water quality, BPJ and State Certification requirements. Relief from anti-backsliding provisions can only be granted under one of the defined exceptions [See 40 CFR §122.44(l)(i)]. Since none of these exceptions apply to this facility, the effluent limits in the Draft Permit must be as stringent as those in the Current Permit.

4. Anti-Degradation

Federal regulations found at 40 CFR Section 131.12 require states to develop and adopt a statewide anti-degradation policy which maintains and protects existing instream water uses and the level of water quality necessary to protect the existing uses, and maintains the quality of waters which exceed levels necessary to support propagation of fish, shellfish, and wildlife and to support recreation in and on the water. The Massachusetts Anti-Degradation Regulation is found at Title 314 CMR 4.04. All existing uses of the Millers River and Charles River must be protected.

B. Description of the Facility

Ready-mix concrete batching operations which occur at the Plant involve raw material storage, concrete production, truck wash-off and drum wash-out, waste disposal and recycling, vehicle fueling, water recycling, and wastewater treatment operations as described below and provided in the Site Plan (Attachment D) and the Process Operations Process Flow Diagram (Attachment E).

The majority of the land at the site is covered by overhead highways (Interstate 93) which capture storm water that would otherwise fall on the site beneath. The storm water runoff which falls on the overhead structures is conveyed through the storm water management system for the roadways. The site is comprised of primarily impervious surface areas and is divided into seven drainage areas as delineated in Attachment F – Site Drainage Plan. Dust control is performed throughout the site by the use of sprinklers.

1. Raw Material Storage

Raw materials used in the production of ready-mix concrete at the facility include a variety of fine and course aggregate, Portland cement, other cementitious materials such as fly ash and ground granulated blast furnace slag, and concrete additives.

Course and fine aggregate are received at the facility by truck or rail car and offloaded and stockpiled at the southern portion of the site at the aggregate material storage area. A conveyor belt runs in a tunnel underneath the stockpiled materials. A gate is opened to allow the materials to fall onto the conveyor, for transport to enclosed hoppers, where the material is stored until it is metered into a ready-mix concrete batch. The portions of the stockpile that are located under Interstate 93 are not exposed to storm water, whereas, the remaining portions are exposed to storm water. Since the aggregate material storage area is pervious, most storm water is absorbed by the stockpiled materials. The minimal amount of storm water that enters the conveyor tunnel

through the gate is pumped to the low point at the WWTF. Any storm water runoff from the stockpile areas is also directed to the WWTF. Concrete walls constructed of pre-cast concrete blocks surround the stockpile perimeter.

Portland cement, fly ash, and slag are received at the facility by tanker truck and pneumatically offloaded and stored in silos until the material is metered into a ready-mix concrete batch.

Concrete additives such as water-reducing agents, air-entraining agents, and/or setting agents may be added to a ready-mix batch to enhance the concrete properties. Liquid concrete additives are stored in aboveground tanks in an enclosed area near the central mix plant for introduction into ready-mix concrete batches based on user specifications. Solid additives such as FiberMesh are delivered in smaller bags which are stored in a covered area and not exposed to storm water.

2. Concrete Production

Three central mix drums are located onsite. Two of the drums are used to manufacture concrete and one is used to manufacture flowable fill.

Basic components of concrete are coarse aggregates (crushed stone or gravel), fine aggregate (usually natural sand), cement, and water. The aggregate functions as a filler material and is bound together by hardened cement paste formed by chemical reactions (hydration) between the cement and water. In addition to these basic components, supplementary cementitious materials and chemical admixtures are often used to enhance or modify properties of the fresh or hardened concrete.

Ready-mix batches are prepared based on industry standards for varying classifications of concrete, which may include certain admixtures. Raw materials for each batch are metered into a central mix drum above the truck awaiting loading at the filling location within the central mix plant area. The materials are mixed inside the central mix drum and discharged into the top of the truck drum for delivery.

In July 2003, the new central mix plant dedicated to manufacturing flowable fill was installed to meet the increasing demand for easily removable fill for covering utility trenches. The new plant includes bins for additional storage of fly ash and uses cement from already existing storage bins. The flowable fill process consumes over five times more water than the standard concrete process, however, the purity of the required water is lower. Therefore, the flowable fill process uses water from the wastewater recycle system, which is discussed below.

3. Truck Rinsing

Wastewater is generated in two process operations including external truck wash-off prior to shipment and internal drum wash-out upon the return of the truck from the job site. After a ready-mix batch has been added to the truck drum and prior to shipment to the job site, the truck is rinsed at one of the designated areas of the facility to remove residual materials from the

outside of the truck's drum and chute. The rinsing prevents adherence of the residuals to the truck and drum, as well as release to the environment outside of the facility. Although no surfactants are used in the rinsing, acid wash may be used, which is applied to the truck exterior with a spray bottle and rinsed off with water. The designated rinsing facilities include the aggregate reclaim wash area and the WWTF wash area. Wastewater generated at the aggregate reclaim wash area is collected in a settling basin and either recycled or transferred to the influent lagoon at the WWTF. Rinsing conducted at the WWTF wash area flows by gravity to lagoon 7 for subsequent treatment at the WWTF.

After a truck returns to the plant and returned concrete is removed from the drum of the truck, the interior of the drum is rinsed out at the aggregate reclaim wash area. Water is added to the drum while it is rotating in order to remove the residual concrete from inside the drum and off of the blades inside the drum. No surfactants are used for drum wash-out. The drum wash-out water is discharged into a receiving basin (reclaimer) and is then either recycled or transferred to lagoon 7 for subsequent treatment at the WWTF.

4. Returned Concrete

Upon return of the truck to the Plant, unused concrete may be reused in pre-cast retaining blocks, reclaimed by separating the aggregate from the wet mix, or recycled by ribbon feed drying the concrete and breaking it into smaller pieces for reuse as fill or road base. Pre-cast retaining blocks are either sold, or used at the facility to construct partitions for the separation of materials and to erect semi-permanent walls for the protection of site features from truck traffic. The aggregate reclaimer separates slurry water from the aggregate and recycles water into the concrete production operations. Ribbon feed drying involves discharge of the concrete in narrow rows, also referred to as "ribbons," onto the ground in a designated area for drying. When the ribbons are partially dry, a front-end loader is used to break the material into small pieces which are shipped offsite for further sizing to prepare the material for off-site use such as road base.

5. Vehicle Fueling

Two 10,000 gallon underground storage tanks (USTs) are in use at the facility, one gasoline and one diesel fuel. They are located, along with the fueling equipment, between the boiler room/QC building and aggregate reclaim wash area. Spill response equipment is located throughout the site as well as on the trucks, for use in the event of a spill.

6. Wastewater Treatment

The WWTF consists of three settling basins (lagoons 7, 8, and 9) and a building containing pumps, piping, and treatment chemicals (block house). Process water and commingled storm water are treated at the block house by the process of settling, chemical treatment, and clarification (for suspended solids, turbidity control, and sulfate removal), and pH neutralization. Refer to Attachment G for the Wastewater Treatment Process Flow Diagram.

The influent to the WWTF consists of water pumped from the two low points on the site (located near the aggregate reclaim area and the recycle water storage tank), which combines with the water from the third low point (located near the WWTF). Boiler blowdown occurs in a building adjacent to the QA/QC lab and is discharged to the low point by the WWTF.

Wastewater from the third low point is conveyed to the primary settling/equalization basin (lagoon 7) where both flow equalization and primary solid settling is accomplished. This basin measures 48 feet long, 16 feet wide, and has a tapered ramp at one end to a maximum depth of 3 feet. The maximum holding capacity of this basin is 14,300 gallons. Settled solids (primarily cement solids, sand, and small stone) are periodically removed (approximately every 2 weeks – 2 months) from the lagoon by a front-end loader to dewater at a bermed area between the fuel loading rack and the aggregate reclaim area. These solids are combined with returned concrete, recycled and sold for use as road base, as described above.

The water from lagoon 7 is pumped to a rapid mix/flocculator tank inside the block house where chemical feed (polyaluminum chloride coagulant, hydrochloric acid, and polymer) and flocculation of suspended solids is accomplished as a batch process. The wastewater transfer pump is controlled by an automatic float system which activates the pump when the water in lagoon 7 reaches a set level (approximately 3,000 – 4,000 gallons). Coagulant and polymer injection pumps turn on automatically when the wastewater transfer pump starts. The coagulant and polymer pumps are set to deliver doses established during wastewater treatability studies, but may be manually adjusted to handle changes in solids loading. Additionally, a pump connected to a pH controller injects acid to neutralize the wastewater whenever the controller set point is reached.

Effluent from the rapid mix/flocculator tank flows by gravity through a flow distributor to lagoon 8 for clarification. Lagoon 8 measures 48 feet long, 16 feet wide, and has a tapered ramp at one end to a maximum depth of 4 feet. The maximum holding capacity of this basin is 17,900 gallons. Flocculated solids settle in lagoon 8. Settled solids are periodically removed (approximately every 6 months – 1 year) from the lagoon by a front-end loader to dewater at a bermed area between the fuel loading rack and the aggregate reclaim area. These solids are combined with leftover concrete for use as road base.

When the water reaches a set level in lagoon 8, it is pumped back through the block house and into lagoon 9, where additional settling of any solids is accomplished. A pH probe in the block house is connected to a controller that activates an alarm and shuts off the pump if the pH measures outside of the prescribed limits. Lagoon 9 measures 35 feet long, 16 feet wide, and has a tapered ramp to a maximum depth of 2.4 feet. Lagoon 9 holds 4,100 gallons and discharges by gravity over a 3 foot wide weir through a 12” pipe to the Millers River. Settled solids are periodically removed (approximately every year) from the lagoon by a front-end loader and recycled for use as road base.

Since May 2003, BS&G has operated a wastewater recycle system at the facility. The recycle system was a Supplemental Environmental Project (SEP), undertaken as part of a negotiated

settlement with EPA (U.S. EPA v. BS&G, Civil Action No. 02-10999 JLT). Prior to installation and operation of the recycle system, wastewater from concrete manufacturing processes and washing operations commingled with storm water, was treated by the onsite WWTF, and discharged to the Millers River.

The recycle system consists of two new pumps in each of two water accumulation areas known as the "slurry pit" and the "clearwater pit," both located at the aggregate reclaim area. The "slurry pit" is a tank containing a mixture of fine particles and water, which is produced from dumping the wash out from truck's mixer drums into screw machines to separate the sand and stone from the water and fine particulate matter. The sand and stone are separated into piles for reuse, and the water and fine particulate drop into the "slurry pit" holding tank. The "clearwater pit" is a concrete holding tank containing water from wash-off of residue from mixer trucks prior to leaving the facility. The trucks are rinsed off over an impervious half-acre area and the wash water flows, along with any storm water collected over the impervious area, through shallow tanks where solids settle, to the "clearwater pit" holding tank.

The two pumps of the recycle system transfer slurry and clearwater to the blending tank with an agitator (referred to as the "SEP tank"). The proportion of slurry to clearwater is determined by sensors and computer controls which measure the density of water in the two tanks and calculate the correct proportions to produce the desired density of water for use in new concrete. The pumping is then controlled by the computer in order to achieve the set density in the blending tank. In addition to mixing, the blending tank also acts as a holding vessel prior to pumping the recycled water into the manufacturing process. Two pumps transfer water into two water scales located inside the batch plant. The scales weigh the recycled water which is transferred to the central mix plant. A computerized concrete batch control system activates the pumps until the required weight of water is measured and then opens a valve to divert the recycled water into the correct mixing plant. Since implementation of the recycle system, BS&G has reduced its use of potable water by 10 to 20% and has reduced the amount of process water sent to waste treatment by up to 55%. The savings from water recycling depends upon factors such as product mix and production volume. BS&G is steadily increasing the percentage of product manufactured with recycled water.

C. Description of Discharge

The discharge from Outfall 001 consists of a combination of storm water runoff, road sweeping water, boiler blowdown water, and truck wash-off and wash-out water. All storm water and process water is either treated at the WWTF prior to discharge to the Millers River, or recycled onsite for use in making concrete and flowable fill. The discharge from Internal Outfall 002 consists of boiler blowdown water.

The drainage at the site is such that the process water and storm water combine and collect at three low points onsite. The water from two of the three low points (located near the aggregate reclaim area and the recycle water storage tank) is pumped to the third low point near the WWTF for subsequent treatment prior to discharge.

Process water and commingled storm water are treated at the WWTF prior to final discharge to the Millers River. Treated wastewater is discharged intermittently from lagoon 9 when the pump from lagoon 8 to lagoon 9 turns on. With the exception of flow, the discharge is sampled at a weir in lagoon 9, after treatment though the WWTF, but prior to discharge to the Millers River. The flow (from lagoon 8 to 9) is monitored by a continuous flow monitor inside the block house.

D. Description of Receiving Water

The facility discharges treated process water and storm water from Outfall 001 to Millers River, which then flows to the Charles River, and ultimately to Boston Inner Harbor. Millers River is classified as a Class B water by the State of Massachusetts (314 CMR 4.06). These waters are designated at habitat for fish, other aquatic life, and wildlife, and for primary and secondary contact recreation. Where designated they shall be suitable as a source of public water supply with appropriate treatment. They shall be suitable for irrigation and other agricultural uses and for compatible industrial cooling and process uses. These waters shall have consistently good aesthetic value. According to the *Final Massachusetts Year 2004 Integrated List of Waters*, the Millers River, from the headwaters to the confluence with the Charles River in Cambridge, is classified as a water requiring a TMDL due to impairment by priority organics, metals, oil and grease, other habitat alterations, and taste, odor and color.

The Charles River, from the Watertown Dam, Watertown to Science Museum, Boston, is also classified as a Class B water body by the Commonwealth of Massachusetts. Additionally, these waters are known to receive discharges from CSOs. According to the *Final Massachusetts Year 2004 Integrated List of Waters*, the Charles River in the area of the discharge is classified as a water requiring a TMDL for unknown causes, unknown toxicity, priority organics, metals, nutrients, organic enrichment/low dissolved oxygen, pathogens, oil and grease, noxious aquatic plants, turbidity, and taste, odor and color.

E. Proposed Permit Effluent Limitations and Conditions

The draft NPDES permit for BS&G authorizes the discharge of treated process water and treated storm water through Outfall 001. This discharge is subject to effluent limitations and applicable water quality standards and requirements, developed and implemented for privately owned systems discharge(s) in accordance with Section 402(a)(1) of the CWA. The effluent parameters in the draft permit are discussed in more detail below. The sections are divided according to the effluent characteristic being regulated.

1. Outfall 001

a. Flow

Review of DMRs submitted by the facility show that flow from the facility on average is 87,000 gpd, with a minimum flow of 99 gpd and a maximum flow of 298,000 gpd. The requirement to

continuously monitor maximum daily flow rate has been retained in the draft permit. Additionally, the previous permit requirement to report the maximum and minimum daily flow rates and total flow for each operating date has been removed from the permit and a requirement to report the average monthly flow rate has been added to the draft permit. The average monthly flow rate shall be calculated as an average of the daily flow rates taken during each month.

b. Total Suspended Solids (TSS)

The TSS effluent limitations, measured 3 times per week, of 45 mg/L maximum daily and 20 mg/L average monthly have been retained in the draft permit based on anti-backsliding requirements found in 40 CFR §122.44(l).

At the time of current permit issuance, the permittee was in the process of upgrading the treatment system. Therefore, the current permit allowed the permittee to average the TSS values over each calendar quarter in order to achieve compliance with the limits. The fact sheet supporting the current permit states that the limits are expected to be able to be met once the treatment modifications are complete. Since the treatment system upgrade is now complete, the permittee should be able to meet the permit limits without averaging the samples over each calendar quarter. Therefore, the draft permit requires that the permittee report the maximum daily and average monthly TSS values, without averaging over each calendar quarter.

Review of DMR data reveals that both the maximum daily and average monthly values for TSS have been exceeded on one occasion, with a maximum daily value of 85 mg/L and an average monthly value of 28 mg/L. Based on this data, the monitoring frequency of 3/week has been reduced to 1/week.

c. pH

The Massachusetts Surface Water Quality Standards [314 CMR 4.05 (3)(b)3] require that the pH of the receiving water be in the range of 6.5 to 8.3 standard units (SU) and no more than 0.5 units outside the background range. Additionally, the State Standards require that there shall be no change from background conditions that would impair any use assigned to this Class. The pH range limit of 6.0 – 8.5 SU contained in the existing permit has been retained in the draft permit, since the State pH range is expected to be met instream. The retention of this limit is also based on anti-backsliding requirements found in 40 CFR §122.44(l).

Review of the DMR data from January 2002 to March 2006 reveals that the effluent has not exceeded the pH limit range. Based on this data, the monitoring frequency of 2/week has been reduced to monthly.

d. Turbidity

Due to the nature of operation, which involves storage of stockpiled materials, there is reasonable potential for turbidity in the discharge. In order to minimize this turbidity, an average monthly

limit 25 NTU is included in the draft permit, as well as a requirement to report the maximum daily TSS. This limit has been retained in the draft permit in accordance with the anti-backsliding requirements found in 40 CFR §122.44(l).

Review of the DMR data reveals that the 25 NTU average monthly turbidity limit was exceeded 1 time. Therefore, EPA has determined that sampling frequency for turbidity shall be reduced in this permit from 2/week to 1/week.

e. Sulfates, Total

Based on anti-backsliding requirements found in 40 CFR §122.44(l), the average monthly limit of 250 mg/L has been retained in the draft permit. The requirement to report the maximum daily limit has also been retained.

Review of the DMR data from January 2002 to March 2006 reveals that the average monthly sulfate limit was exceeded 1 time. Therefore, EPA has determined that sampling frequency for sulfate shall be reduced in this permit from 1/week to monthly.

f. Priority Pollutant Scan

The priority pollutant scans, to be completed during the first and second years of the permit, have raised some concern with the levels of copper, chromium, and aluminum in the discharge from the facility.

Copper was detected in both priority pollutant scans, once at 60 ug/L and once at 30 ug/L, and in permit application Form 2C at 60 ug/L. Total chromium was detected in both scans, once at 30 ug/L and once at 20 ug/L, as well as in permit application Form 2C at 40 ug/L. Aluminum was detected in both scans, once at 170 ug/L and once at 470 ug/L, and in permit application Form 2C at 1300 ug/L. These metals are toxic to aquatic life at low concentrations.

The reported metals concentrations are expressed as total recoverable fraction in the water column. However, the National Recommended Water Quality Criteria for Copper and Chromium (VI) are expressed as total dissolved fraction in the water column. In order to directly compare the National Recommended Water Quality Criteria for Copper and Chromium (VI) to the measured values, the National Recommended Water Quality Criteria must be converted to total recoverable fraction in the water column.

Pollutant specific conversion factors (CF) are used for converting a metal criterion expressed as the dissolved fraction in the water column to a criterion expressed as the total recoverable fraction in the water column. The equations and constants for determining the water quality criteria for each metal and the conversion factors and equation parameters are listed in EPA's *National Recommended Water Quality Criteria* as published in the Federal Register on December 10, 1998 (63 FR 68354) and updated November 2002 (USEPA. 2002). Since the hardness of the receiving water is not known at this time, EPA assumed a hardness of 50 mg/L as $CaCO_3$ when calculating

the total recoverable criteria, summarized in Table 1, below. The total recoverable criteria should be re-calculated at the time of next permit re-issuance, using the actual hardness of the receiving water and effluent, as is required to be reported by the draft permit.

Additionally, in the draft permit, EPA is requiring collection of additional data for each metal of concern. The data collected as a result of the monitoring required in the draft permit may be evaluated in the future to determine if there is a reasonable potential for metals in the effluent to cause or contribute to a violation of water quality standards. EPA is also suggesting development of BMPs to reduce the amount of metals in the effluent from the facility. The metals of concern are discussed separately in the sections that follow.

The requirement for priority pollutant scans has been removed from the permit, however, upon permit re-application; BS&G is required to include a priority pollutant scan with the re-application. Therefore, although not specifically required by the permit, BS&G must submit a priority pollutant scan for EPA review, prior to permit re-issuance.

Table 1. Acute and Chronic Criteria for Copper and Chromium (1)

Parameter	Maximum Reported Effluent Discharge Concentration(2) ug/l	Dissolved Criteria CMC (Acute) ug/l	Dissolved Criteria CCC (Chronic) ug/l	Conversion Factor (Acute)	Conversion Factor (Chronic)	Total Recoverable Criteria CMC (Acute) ug/l	Total Recoverable Criteria CCC (Chronic) ug/l
Copper	60	8.85 (3)	6.28 (3)	0.960	0.960	9.22	6.54
Chromium (VI)	40	16 (4)	11 (4)	0.982	0.962	16.3	11.4

(1) Calculations based on *The Metals Translator: Guidance For Calculating A Total Recoverable Permit Limit From Dissolved Criterion (USEPA, 1996)*
(2) Data is from priority pollutant scans and Form 2C of the permit re-application, submitted by BS&G.
(3) Assumed Total Hardness (as CaCO3) of 50 mg/L, absent any actual hardness value for the receiving water and the discharge from the facility.
(4) Based on the National Recommended Water Quality Criteria.

g. Copper

The National Recommended Water Quality Criteria for copper in freshwater is 13 ug/L CMC [criteria maximum concentration (acute)] and 9.0 ug/L CCC [criteria continuous concentration (chronic)], expressed as dissolved metal in the water column and assuming a hardness of 100 mg/L. Assuming a hardness of 50 mg/L, the dissolved criteria for copper is 8.85 ug/L CMC and 6.28 ug/L CCC. Expressed as total recoverable metal in the water column, the criteria for copper is 9.22 ug/L CMC and 6.54 ug/L CCC (see Table 1, above). Copper has been detected on three occasions in the discharge from the facility at levels ranging from 30 – 60 ug/L. EPA has determined that more information is necessary to assess the level of copper in the discharge.

Therefore, the draft permit establishes a monitoring requirement for copper. The daily maximum total recoverable copper concentration shall be recorded monthly.

Additionally, the draft permit requires sampling for hardness (mg/L as $CaCO_3$) in both the receiving water and effluent, in order to assist in calculating effluent limitations for copper in the future, if necessary, since the freshwater criteria for copper is expressed as a function of hardness in the water column. The daily maximum value for hardness of both the receiving water and effluent shall be recorded monthly. This hardness value may slightly alter the total recoverable criteria which were calculated above.

Additionally, the draft permit requires the permittee to develop a study to identify the source of copper, with subsequent implementation of Best Management Practices (BMPs), developed pursuant to the Storm Water Pollution Prevention Plan (SWPPP), in order to reduce the amount of copper in the discharge from the facility. Based on this study and/or the sampling results, EPA may decide to require effluent limitations for copper in the future.

h. Chromium

The National Recommended Water Quality Criteria for chromium (III) in freshwater is 570 ug/L CMC and 74 ug/L CCC and for chromium (VI) in freshwater is 16 ug/L CMC and 11 ug/L CCC, expressed as dissolved metal in the water column. Expressed as total recoverable metal in the water column, the criteria for chromium (VI) is 16.3 ug/L CMC and 11.4 ug/L CCC. Total chromium has been detected on three occasions in the discharge from the facility at levels ranging from 20 – 40 ug/L. EPA has determined that more information is necessary to assess the levels and types of chromium in the discharge. While chromium (III) occurs naturally in the environment and is an essential nutrient, chromium (VI) is a known human carcinogen.[1] For this reason, EPA is concerned with the portion of chromium (VI) in the total chromium levels reported in the discharge. Therefore, the draft permit requires monthly monitoring for chromium (VI).

The draft permit requires the permittee to develop a study to identify the source of chromium (VI), with subsequent implementation of BMPs, developed pursuant to the SWPPP, in order to reduce the amount of chromium (VI) in the discharge from the facility. Based on this study and/or the sampling results, EPA may decide to require effluent limitations for chromium (VI) in the future.

i. Aluminum

The National Recommended Water Quality Criteria for aluminum in freshwater (with pH from 6.5 – 9.0) is 750 ug/L CMC (acute) and 87 ug/L CCC (chronic), expressed as total recoverable

---

1 Agency for Toxic Substances and Disease Control (ATSDR). *ToxFAQs for Chromium.* (February 2001)

metal in the water column. Aluminum has been detected on three occasions in the discharge from the facility at levels ranging from 170 – 1300 ug/L. EPA has determined that more information is necessary to assess the levels of aluminum in the discharge. The draft permit requires monthly monitoring for aluminum.

The draft permit requires the permittee to develop a study to identify the source of aluminum, with subsequent implementation of BMPs, developed pursuant to the SWPPP, in order to reduce the amount of aluminum in the discharge from the facility. Based on this study and/or the sampling results, EPA may decide to require effluent limitations for aluminum in the future.

j. Whole Effluent Toxicity Testing (WET Testing)

Under Section 301(b)(1)(C) of the CWA, discharges are subject to effluent limitations based on water quality standards. The Massachusetts Surface Water Quality Standards include the following narrative statement and requires that EPA criteria established pursuant to Section 304(a)(1) of the CWA be used as guidance for interpretation of the following narrative criteria: All surface waters shall be free from pollutants in concentrations or combinations that are toxic to humans, aquatic life or wildlife.

National studies conducted by the EPA have demonstrated that point sources contribute toxic constituents. These constituents include metals, chlorinated solvents, aromatic hydrocarbons and others. The Region's current policy is to include toxicity testing requirements in all permits, while Section 101(a)(3) of the CWA specifically prohibits the discharge of toxic pollutants in toxic amounts.

Based on the high levels of metals that have been detected in the discharge from the facility and the potential integrated effects of these pollutants, as well as the potential for toxicity resulting from storm water, in accordance with EPA national and regional policy, and in accordance with MassDEP policy, the draft permit includes acute and chronic toxicity monitoring requirements. (See Policy for the Development of Water Quality-Based Permit Limitations for Toxic Pollutants,50 Fed. Reg. 30,784 (July 24, 1985); EPA's Technical Support Document for Water Quality-Based Toxics Control" on September, 1991; and MassDEP's Implementation Policy for the Control of Toxic Pollutants in Surface Waters (February 23, 1990).

The draft permit requires that the permittee conduct freshwater chronic (and modified acute) WET testing for the Outfall 001 effluent, one during each year of the effectiveness of the permit. Two of the first fiveWET tests shall be performed during boiler blowdown discharge. The chronic test may be used to calculate the acute LC_{50} at the 48 hour exposure interval. The permittee shall test the daphnid, Ceriodaphnia dubia, and fathead minnow, Pimephales promelas. The tests must be performed in accordance with test procedures and protocols specified in Attachment 1 of the permit.

k. Other Parameters of Potential Concern

Iron

Sector E of the MSGP (Glass Clay, Cement, Concrete, and Gypsum Products) for SIC Code 3272 contains a benchmark monitoring cutoff concentration of 1.0 mg/L for Total Recoverable Iron. Previous monitoring for iron has consistently been below this benchmark monitoring concentration (with three samples ranging from 0.28-0.31 mg/L). However, if future monitoring (such as the priority pollutant scan required in the permit re-application) shows that this benchmark monitoring cutoff concentration is exceeded, the facility may be required to sample for iron, and/or develop BMPs, pursuant to the SWPPP, to reduce the level of iron in the discharge from the facility. The draft permit does not require monitoring for iron at this time.

Chlorine

A prohibition on the use of chlorine has been retained in the draft permit in Part I.A.4 based on anti-backsliding requirements found in 40 CFR §122.44(l).

2. Internal Outfall 002

a. Oil and Grease (O&G)

Monitoring data from the permit re-application Form 2C and both priority pollutant scans shows no detection of O&G in the overall discharge from the facility, however, in the draft permit, EPA has determined using BPJ that the discharge from boiler blowdown meet a 20.0 mg/L maximum daily limit and a 15.0 mg/L average monthly limit for oil and grease. This BPJ determination was made using the Steam Electric Power Generating Point Source Category ELGs as guidance. Therefore, the draft permit requires that a representative sample of the discharge from boiler blowdown, prior to commingling with other discharges, shall be taken on a quarterly basis with effluent limitations consistent with these technology-based limits at Internal Outfall 002.

3. Storm Water Pollution Prevention Plan (SWPPP)

This facility engages in activities which could result in the discharge of pollutants to waters of the United States either directly or indirectly through storm water runoff. These operations include at least one of the following: material storage, in-facility transfer, material processing, material handling, or loading and unloading. To control the activities/operations, which could contribute pollutants to waters of the United States, potentially violating the State's Water Quality Standards, the Draft Permit requires the facility to maintain, update and implement a Storm Water Pollution Prevention Plan (SWPPP) containing BMPs appropriate for this specific facility (See Sections 304(e) and 402(a)(1) of the CWA and 40 CFR §125.103(b)). Specifically, at this facility, the storage of fine and course aggregate, Portland cement, other cementitious materials such as fly ash and ground granulated blast furnace slag, and concrete additives are examples of material storage, and concrete production is an example of processing operations, which shall continue to be included in the SWPPP.

The goal of the SWPPP is to eliminate or reduce the potential for the discharge of pollutants through the storm water system. The SWPPP requirements in the Draft Permit are intended to provide a systematic approach by which the permittee shall at all times, properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee to achieve compliance with the conditions or the permit. The SWPPP shall be prepared in accordance with good engineering practices and identify potential sources of pollutants, which may reasonably be expected to affect the quality of storm water discharges associated with industrial activity from the facility. The SWPPP, upon implementation, becomes a supporting element to any numerical effluent limitations in the Draft Permit. Consequently, the SWPPP is as equally enforceable as the numerical limits.

This process involves the following four main steps:

(1) Forming a team of qualified facility personnel who will be responsible for updating the SWPPP and assisting the plant manager in its implementation;
(2) Reassessing the potential storm water pollution sources;
(3) Selecting and implementing appropriate management practices and controls for these potential pollution sources; and
(4) Reevaluating, periodically, the effectiveness of the SWPPP in preventing storm water contamination and in complying with the various terms and conditions of the Draft Permit.

Additionally, the permittee shall develop and implement both a study to determine the source of metals and subsequent BMPs to reduce the level of metals in the discharge.

V. ENDANGERED SPECIES ACT

Section 7(a) of the Endangered Species Act of 1973, as amended (ESA) grants authority to and imposes requirements upon Federal agencies regarding endangered or threatened species of fish, wildlife, or plants ("listed species") and habitat of such species that has been designated as critical (a "critical habitat"). The ESA requires every Federal agency, in consultation with and with the assistance of the Secretary of Interior, to insure that any action it authorizes, funds, or carries out, in the United States or upon the high seas, is not likely to jeopardize the continued existence of any listed species or result in the destruction or adverse modification of critical habitat. The United States Fish and Wildlife Service (USFWS) typically administer Section 7 consultations for bird, terrestrial, and freshwater aquatic species. The National Marine Fisheries Service (NMFS) typically administers Section 7 consultations for marine species and anadromous fish.

EPA has reviewed the federal endangered or threatened species of fish, wildlife, or plants to see if any such listed species might potentially be impacted by the re-issuance of this NPDES permit. The review has focused on freshwater aquatic species since the discharge is into Millers River. EPA believes that effluent limitations and other permit conditions which are in place in the draft permit should preclude any adverse effects should there be any incidental contact with listed species either in the Millers River or Charles River. During the public comment period, EPA has provided a copy of the draft permit and fact sheet to USFWS and NMFS.

VI. ESSENTIAL FISH HABITAT

Under the 1996 Amendments (PL 104-267) to the Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. § 1801 et seq. (1998)), EPA is required to consult with NMFS if EPA's action or proposed actions that it funds, permits, or undertakes, "may adversely impact any essential fish habitat" (EFH). The Amendments define EFH as "waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity," (16 U.S.C. § 1802(10)). "Adverse impact" means any impact which reduces the quality and/or quantity of EFH (50 C.F.R. 600.910 (a)). Adverse effects may include direct (e.g., contamination or physical disruption), indirect (e.g., loss of prey, reduction in species' fecundity), site-specific or habitat-wide impacts, including individual, cumulative, or synergistic consequences of actions. Id.

Essential fish habitat is only designated for species for which federal fisheries management plans exist (16 U.S.C. § 1855(b)(1)(A)). EFH designations for New England were approved by the U.S. Department of Commerce on March 3, 1999.

A review of the relevant essential fish habitat information provided by NMFS indicates that essential fish habitat has been designated for 23 managed species in the area surrounding the Millers River. The area supports 15 of the 23 listed species during three or more of the life stage categories (i.e. eggs, larvae, juveniles, adults, and spawning adults). A copy of the managed species within the EFH is included in Attachment H to this Fact Sheet. EPA has concluded that adverse effects to EFH from this permitted discharge have been minimized. This conclusion is based on the amount and frequency of the discharge, as well as effluent limitations and other permit requirements that are identified in this Fact Sheet. These factors are designated to be protective of all aquatic species, including those with EFH designations.

EPA has determined that no EFH consultation with NMFS is required at this time. If adverse effects are detected as a result of this permit action, NMFS will be notified and an EFH consultation will promptly be initiated. During the public comment period, EPA has provided a copy of the Draft Permit and Fact Sheet to NMFS.

VII. STATE CERTIFICATION REQUIREMENTS

EPA may not issue a permit unless the MassDEP certifies that the effluent limitations contained in the permit are stringent enough to assure that the discharge will not cause the receiving water to violate State Surface Water Quality Standards or unless state certification is waived. The staff of the MassDEP has reviewed the draft permit and advised EPA that the limitations are adequate to protect water quality. EPA has requested permit certification by the State pursuant to 40 CFR §124.53 and expects that the draft permit will be certified.

VIII. ADMINISTRATIVE RECORD, PUBLIC COMMENT PERIOD, HEARING REQUESTS, AND PROCEDURES FOR FINAL DECISION

All persons, including applicants, who believe any condition of the draft permit is inappropriate must raise all issues and submit all available arguments and all supporting material for their arguments in full by the close of the public comment period, to the U.S. EPA, Office of Ecosystem Protection Attn: Nicole Kowalski, 1 Congress Street, Suite 1100 (CIP), Boston, Massachusetts 02114-2023 or via email to kowalski.nicole@epa.gov. The comments should reference the name and permit number of the facility for which they are being provided.

Any person, prior to such date, may submit a request in writing to EPA and the States Agency for a public hearing to consider the draft permit. Such requests shall state the nature of the issues proposed to be raised in the hearing. A public hearing may be held after at least thirty days public notice whenever the Regional Administrator finds that response to this notice indicates significant public interest. In reaching a final decision on the draft permit, the Regional Administrator will respond to all significant comments and make these responses available to the public at EPA's Boston Office.

Following the close of the comment period, and after a public hearing, if such hearing is held, the Regional Administrator will issue a final permit decision and forward a copy of the final decision to the applicant and each person who has submitted written comments or requested notice. Within thirty (30) days following the notice of final permit decision, permits may be appealed to the Environmental Appeals Board in the manner described at 40 CFR § 124.19.

IX. EPA & MassDEP CONTACTS

Additional information concerning the draft permit may be obtained between the hours of 9:00 a.m. and 5:00 p.m., Monday through Friday, excluding holidays, from the EPA and MassDEP contacts below:

Nicole Kowalski, EPA New England – Region 1
1 Congress Street, Suit 1100 (CIP)
Boston, Massachusetts 02114-2023
Telephone: (617) 918-1746 FAX: (617) 918-0746
email: kowalski.nicole@epa.gov

Paul Hogan, Massachusetts Department of Environmental Protection
Division of Watershed Management, Surface Water Discharge Permit Program
627 Main Street, 2nd Floor
Worcester, Massachusetts 01608
Telephone: (508) 767-2796 FAX: (508) 791-4131
email: paul.hogan@state.ma.us

_____
Date

Stephen S. Perkins, Director
Office of Ecosystem Protection

U.S. Environmental Protection Agency

X. ATTACHMENTS

- **A. Site Map**
- **B. Site Locus**
- **C. Summary of DMR Data**
- **D. Site Plan**
- **E. Process Operations Process Flow Diagram**
- **F. Site Drainage Plan**
- **G. Wastewater Treatment Process Flow Diagram**
- **H. Essential Fish Habitat Designation**

ATTACHMENT A

SITE MAP

CLIENT:
Boston Sand & Gravel
Charlestown, MA

Capaccio
Environmental Engineering, Inc.
293 Boston Post Road-West
Marlborough, MA 01752
(508) 970-0033 * www.capaccio.com
"Helping Industry and the Environment Prosper"

TITLE:
40 Bunker Hill Industrial
Park Drive & 500 Front Street

NORTH

SCALE: 1" = 500'-0"
JOB # 01-027I
DATE: 08-03-06

DR BY: TJL
CK BY: WEB
REV: A

SIZE: A

Y:\Boston Sand & Gravel\Charlestown, MA\01-027I\Figure1_SiteLocation_Rev-.dwg

ATTACHMENT B

SITE LOCUS

Boston Sand & Gravel
40 Bunker Hill Industrial
Park Drive (Northern Circle) &
500 Front Street (Southern Circle)
Charlestown, MA
USGS Ref. Code: 442071-C1-TM-025
1987 (Boston South, MA)

CLIENT: Boston Sand & Gravel Charlestown, MA		Site Locus	Capaccio Environmental Engineering, Inc. 293 Boston Post Road-West Marlborough, MA 01752 (508) 970-0033 * www.capaccio.com "Helping Industry and the Environment Prosper"
TITLE: 40 Bunker Hill Industrial Park Drive & 500 Front Street	NORTH	SCALE: 1" = 1500'-0" JOB # 01-027I DATE: 08-03-06	DR BY: TJL CK BY: WEB REV: A

SIZE: A

Y:\Boston Sand & Gravel\Charlestown, MA\01-027I\Figure1_SiteLocation_Rev-.dwg

ATTACHMENT C

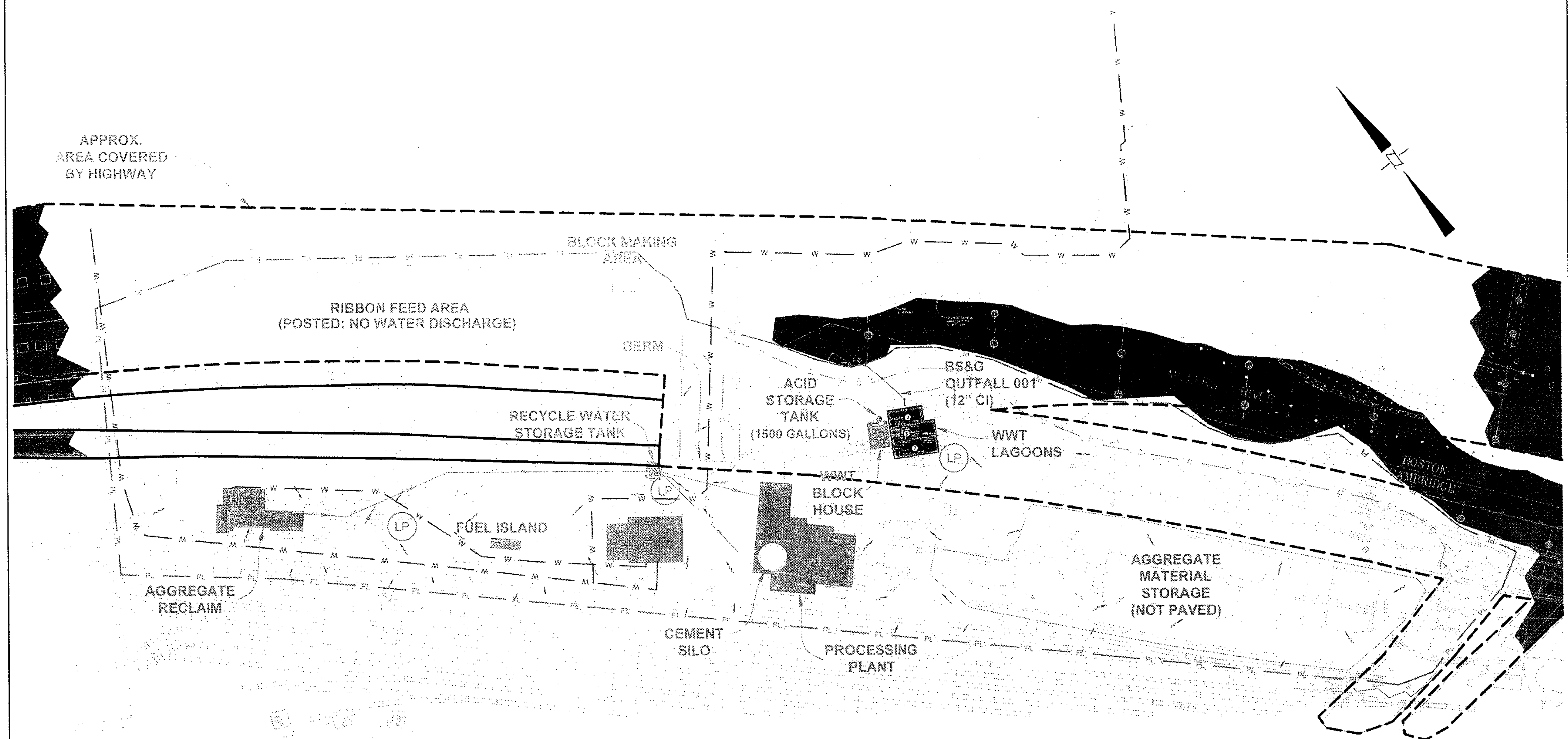
SUMMARY OF DMR DATA

Boston Sand and Gravel DMR Results from PCS
MA0000531

	Turbidity (NTU)		pH (SU)		Total Sulfate, as SO4 (mg/L)		Flow (GPD)	TSS (mg/L)	
Date	max daily	ave month	max conc	min conc	max daily	ave month	max daily	max daily (averaged/quarter)	ave month (averaged/quarter)
31-Mar-06	4.4	2.8	8.2	6.7	280	183	39400	31.5	12.8
28-Feb-06	27	10.8	7.7	6.5	320	189	88100		
31-Jan-06	3	1.8	8.4	6.4	75	50	132000		
31-Dec-05	18	5.8	8.2	6.1	160	117	106000	23	9.7
30-Nov-05	5.6	4.7	7.8	6.4	180	155	80700		
31-Oct-05	10	3.2	8.3	6.7	140	80	298000		
30-Sep-05	2.7	1.5	7.4	6.4	62	48	58700	9	3.9
31-Aug-05	1.3	1	6.9	6.3	66	48	43200		
31-Jul-05	5	2.8	8.1	6.1	75	53	105800	21.7	8.6
30-Jun-05	3.8	3.1	8	7.1	91	74	32800		
31-May-05	2.6	1.17	8.4	6.6	160	95.5	49400		
30-Apr-05	2.44	1.04	8.3	6.5	218	88.7	81000		
31-Mar-05	7.96	3.79	8.3	6.4	98.5	77.3	65100	22.3	8.4
28-Feb-05	7.58	3.09	7.9	7	284	183	46000		
31-Jan-05	2.04	1.28	8.1	7	108	102	62900		
31-Dec-04	5.54	2.51	8.4	6.6	110	57	65100	39	9.8
30-Nov-04	2.71	1.82	8.3	6.8	271	152	48700		
31-Oct-04	5.12	2.27	8.4	6.3	132	88.6	23000		
30-Sep-04	2.15	0.84	7.2	6.8	52.7	33.1	137400	11.3	3.2
31-Aug-04	5.19	2.34	7.6	6.8	41.1	28.3	60000		
31-Jul-04	1.41	1.15	7.9	6.7	39.6	27.5	99		
30-Jun-04	7.74	2.6	8.2	6.5	28.4	19.6	52300	8.3	1.9
31-May-04	1.28	1.04	7.8	6.8	44.8	37.3	40200		
30-Apr-04	3.72	1.65	8.2	7.1	87	66.8	229000		
31-Mar-04	6.39	3.41	7.4	6.4	43.1	30.7	86800	12	3.8
29-Feb-04	4.93	2.77	7.6	6.1	105	46.9	50700		
31-Jan-04	2.04	1.29	8.3	6.2	36.5	19.3	44000		
31-Dec-03	1.52	1.34	8.1	7.2	223	71.8	87000	8.7	2.4
30-Nov-03	1.61	0.95	8.3	7.2	93.2	27.3	55500		
30-Sep-03	1.51	0.89	8.3	7.4	17.5	12.5	77400	13.7	3
31-Aug-03	2.74	0.85	8.1	7.1	44.7	16.8	128500		
31-Jul-03	0.68	0.51	7.9	6.8	101	47.2	209000		
30-Jun-03	0.82	0.54	8.2	6.1	81.9	37.1	83300	17.7	5.2
31-May-03	3.38	1.28	8.2	6.2	139	68.9	98480		
30-Apr-03	1.74	1.18	6.5	6.1	116	48.9	75000		
31-Mar-03	3.09	1.27	8	6.5	68.3	54.3	116900	9	2.3
28-Feb-03	1.72	1.09	8.2	6.5	118	73	141100		
31-Jan-03	2.8	1.28	7.7	6.6	74.2	33.3	86700		
31-Dec-02	4.51	2.1	8.2	6.7	160	57.8	152100	37	8.9
30-Nov-02	3.16	1.18	8.2	6	150	65.4	185100		
31-Oct-02	1.38	0.96	8.2	7.2	120	53.5	149300		
30-Sep-02	1.8	0.69	8.5	6.5	40	22	95200	28	8.1
31-Aug-02	0.98	0.5	8.3	6.8	100	75	69200		
31-Jul-02	1.12	0.64	8	6.2	350	151	31600		
30-Jun-02	12.8	5.96	7.9	6.5	79	37.9	45400	42.3	11.7
31-May-02	4.22	3.05	7.8	6.5	70	37.5	157000		
30-Apr-02	9.1	4.29	8	6.5	140	58.3	41700		
31-Mar-02	5.59	3.11	8	6.3	300	123	36100	85	28.2
28-Feb-02	507	126	8.4	6.2	3800	993	33300		
31-Jan-02	19.4	4.07	7.8	6.4	210	122	81500		
	Turbidity		pH		Total Sulfate, as SO4		Flow	TSS	
	max daily	ave month	Max Conc	Min Conc	max daily	ave month	max daily	max daily (averaged/quarter)	ave month (averaged/quarter).
AVERAGE	14.8862	4.7058	8.002	6.576	198.09	88.762	87255.58	24.67647059	7.758823529
MAXIMUM	507	126	8.5	7.4	3800	993	298000	85	28.2
MINIMUM	0.68	0.5	6.5	6	17.5	12.5	99	8.3	1.9
Previous limits	report	25	8.5	6	report	250	report	45	20
# exceedences	N/A	1	0	0	N/A	1	N/A	1	1

ATTACHMENT D

SITE PLAN



CONTAINMENT

APPROX. PROPERTY LINE

POTABLE WATER SUPPLY

APPROX. LIMITS OF ELEVATED HIGHWAY

APPROX. LIMITS OF SURFACE HIGHWAY

LP LOW POINT

WATER SHED DIRECTION

FOR PERMIT APPROVAL

Not for Construction

REV.	DESCRIPTION	DRW	CHK	ENG	DATE
A	Permit Approval	TJL	RSC	WEB	08-03-06
1	Created	TJL	RSC	WEB	08-02-06

DRAWING TITLE:
Figure 3 - Site Plan

CLIENT:
Boston Sand & Gravel

JOB LOCATION:
Charlestown, MA

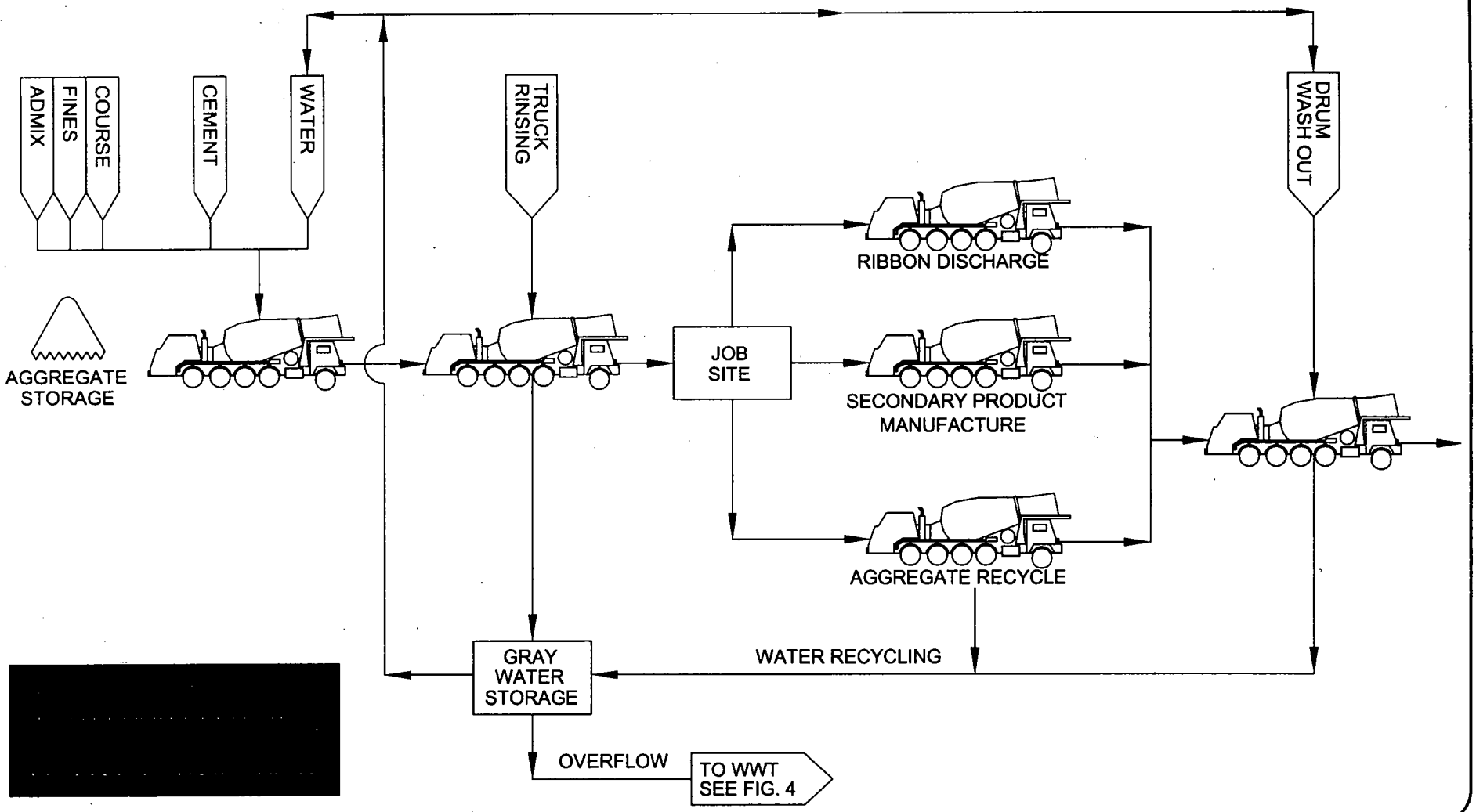
SIGNATURE

Capaccio Environmental Engineering, Inc.
283 Boston Post Road-West
Marlborough, MA 01752
(508) 970-0033 * www.capaccio.com
"Helping Industry and the Environment Prosper"

JOB NUMBER: 01-0271
SHEET:
SCALE: 1" = 60'
SIZE: D

ATTACHMENT E

PROCESS OPERATIONS PROCESS FLOW DIAGRAM



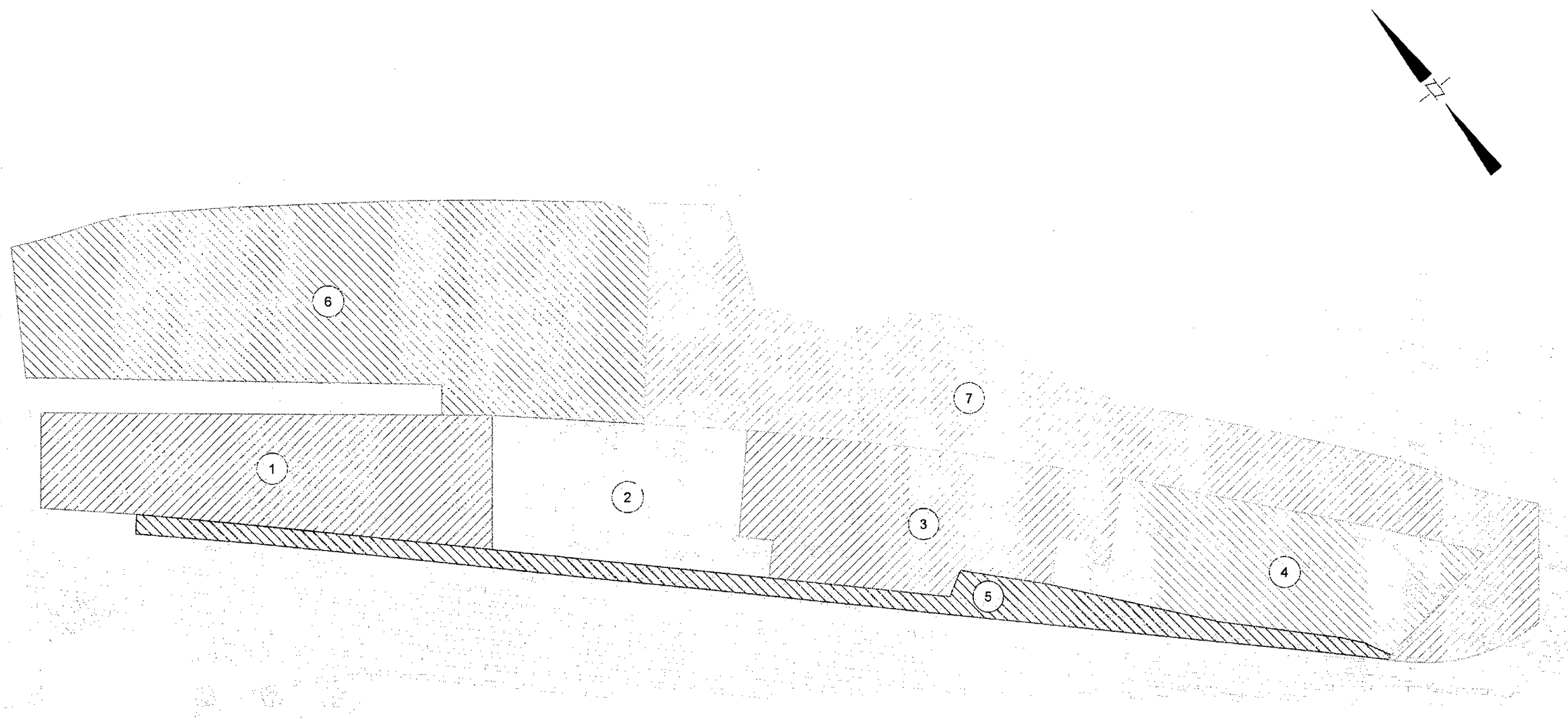
CLIENT: Boston Sand & Gravel Charlestown, MA	Figure 5 - Process Operations PFD	NORTH ○	SIZE: A
TITLE: Process Flow Diagram	SCALE: NTS	DR BY: TJL	
	JOB # 01-027I	CK BY: WEB	
	DATE: 08-03-06	REV: A	

Capaccio Environmental Engineering, Inc.
293 Boston Post Road-West
Marlborough, MA 01752
(508) 970-0033 * www.capaccio.com
"Helping Industry and the Environment Prosper"

Y:\Boston Sand & Gravel\Charlestown, MA\01-027I\Figure1_SiteLocation_Rev-.dwg

ATTACHMENT F

SITE DRAINAGE PLAN



FOR PERMIT APPROVAL

Not for Construction

REV.	DESCRIPTION	DRW	CHK	ENG	DATE
A	Permit Approval	TJL	RSC	WEB	08-03-06
1	Created	TJL	RSC	WEB	06-02-06

DRAWING TITLE:

Figure 4 - Site Drainage Plan

CLIENT:

Boston Sand & Gravel

JOB LOCATION:

Charlestown, MA

SIGNATURE

Capaccio
Environmental Engineering, Inc.
293 Boston Post Road West
Marlborough, MA 01752
(508) 970-0000 * www.capaccio.com
"Helping Industry and the Environment Prosper"

JOB NUMBER: 01-0271

SHEET:

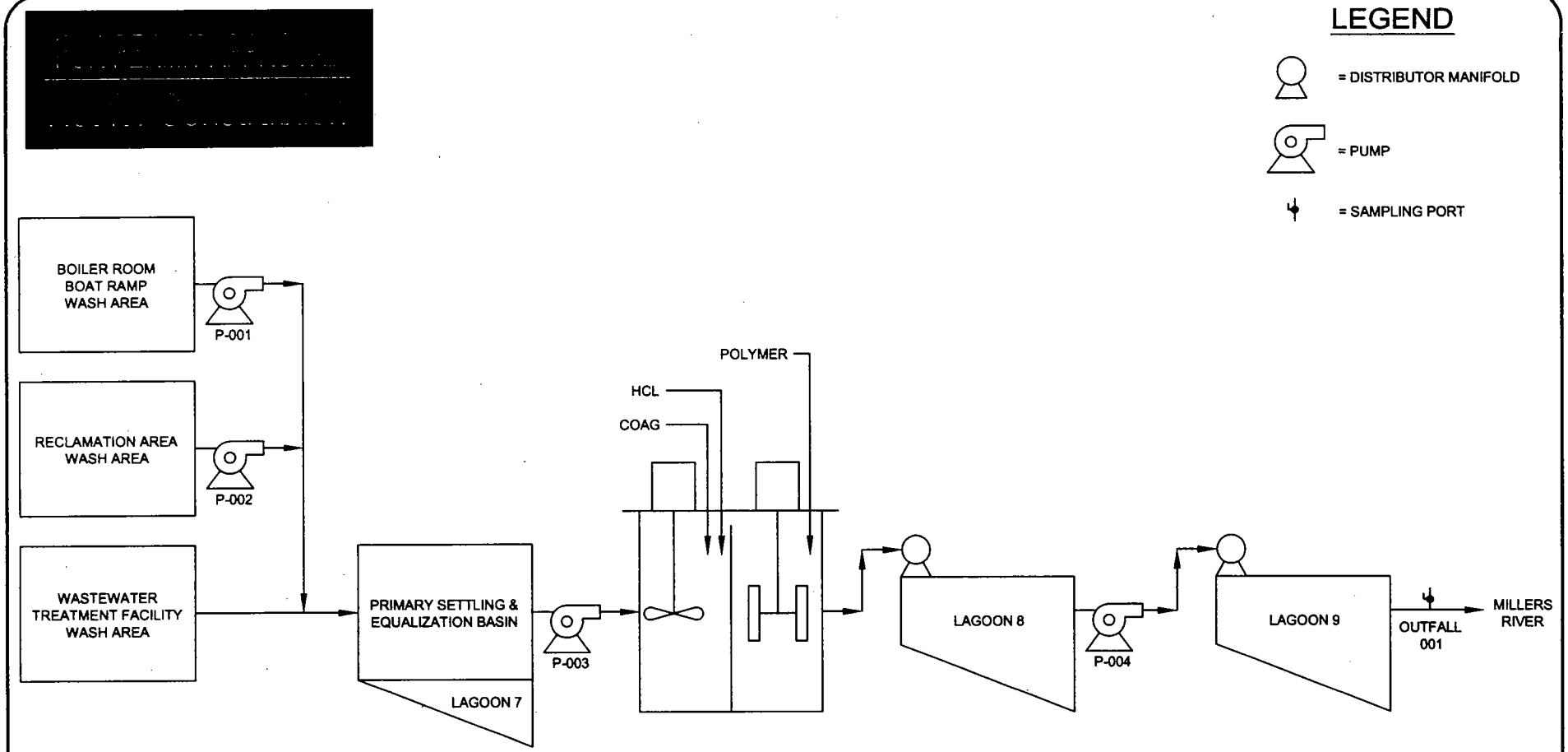
SCALE: 1" = 60'

SIZE: D

ATTACHMENT G

WASTEWATER TREATMENT PROCESS FLOW DIAGRAM

[redacted]



CLIENT: Boston Sand & Gravel Charlestown, MA	Figure 6 - Wastewater Treatment - PFD	NORTH	SIZE: A
TITLE: Process Flow Diagram	SCALE: NTS	DR BY: TJL	
	JOB # 01-027I	CK BY: WEB	
	DATE: 08-03-06	REV: A	

Capaccio
Environmental Engineering, Inc.
293 Boston Post Road-West
Marlborough, MA 01752
(508) 970-0033 * www.capaccio.com
"Helping Industry and the Environment Prosper"

Y:\Boston Sand & Gravel\Charlestown, MA\01-027I\Figure1_SiteLocation_Rev-.dwg

ATTACHMENT H

ESSENTIAL FISH HABITAT DESIGNATION

Summary of Essential Fish Habitat (EFH) Designation

10' x 10' Square Coordinates:

Boundary	North	East	South	West
Coordinate	42° 30.0' N	71° 00.0' W	42° 20.0' N	71° 10.0' W

Square Description (i.e. habitat, landmarks, coastline markers): Waters within the Atlantic Ocean within the square within Massachusetts Bay and within Boston Harbor affecting the following: South Boston, MA., Boston, MA., Chelsea River, Mystic River, Charles River, East Boston, MA., Chelsea, MA., Orient Heights, and most of Logan Airport.

Species	Eggs	Larvae	Juveniles	Adults
Atlantic cod *(Gadus morhua)*	X	X	X	X
haddock *(Melanogrammus aeglefinus)*	X	X		
pollock *(Pollachius virens)*	X	X	X	X
whiting *(Merluccius bilinearis)*	X	X	X	X
offshore hake *(Merluccius albidus)*				
red hake *(Urophycis chuss)*	X	X	X	X
white hake *(Urophycis tenuis)*	X	X	X	X
redfish *(Sebastes fasciatus)*	n/a			
witch flounder *(Glyptocephalus cynoglossus)*				
winter flounder *(Pleuronectes americanus)*	X	X	X	X
yellowtail flounder *(Pleuronectes ferruginea)*	X	X	X	X
windowpane flounder *(Scopthalmus aquosus)*	X	X	X	X
American plaice *(Hippoglossoides platessoides)*	X	X	X	X
ocean pout *(Macrozoarces americanus)*	X	X	X	X
Atlantic halibut *(Hippoglossus hippoglossus)*	X	X	X	X
Atlantic sea scallop *(Placopecten magellanicus)*	X	X	X	X
Atlantic sea herring *(Clupea harengus)*		X	X	X
monkfish *(Lophius americanus)*				
bluefish *(Pomatomus saltatrix)*				
long finned squid *(Loligo pealei)*	n/a	n/a	X	X
short finned squid *(Illex illecebrosus)*	n/a	n/a	X	X

Atlantic butterfish *(Peprilus triacanthus)*	X	X	X	X
Atlantic mackerel *(Scomber scombrus)*	X	X	X	X
summer flounder *(Paralicthys dentatus)*				X
scup *(Stenotomus chrysops)*	n/a	n/a	X	X
black sea bass *(Centropristus striata)*	n/a		X	X
surf clam *(Spisula solidissima)*	n/a	n/a	X	X
ocean quahog *(Artica islandica)*	n/a	n/a		
spiny dogfish *(Squalus acanthias)*	n/a	n/a		
tilefish *(Lopholatilus chamaeleonticeps)*				
bluefin tuna *(Thunnus thynnus)*			X	X